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Subject: Evaluation of Pest Conditions in the West Chevelon Riparian Restoration Project Area

To: District Ranger, Black Mesa Ranger District

I recently met with Gayle Richardson, District Silviculturist, to view the proposed FY2007 West Chevelon Riparian Enhancement Project. Gayle submitted the proposal to cover costs associated with the removal of conifer species on 31 acres of riparian habitat in West Chevelon Creek. This area was recognized as requiring treatment during the Environmental Analysis for the 2005 Nagel Forest Health Project.

The main objective of the project is to promote the growth and vigor of narrowleaf cottonwood (*Populus angustifolia*), mountain alder (*Alnus tenuifolia*), and coyote willow (*Salix exigua*). The prescription includes thinning ponderosa pine, Douglas-fir, and white fir <12" dbh within areas of the floodplain and channel of West Chevelon creek previously dominated by riparian species. Trees that provide stream bank stability would be maintained regardless of size.

Slash within the flood plain would be removed, hand piled, or lopped away from the drainage and flood plain. Slash created outside of fuel breaks or piling areas may be removed from the site to landings or lopped and scattered to within 3 feet of the ground and treated later as part of a broadcast burn.

Figure 1 Ponderosa pine seedlings and saplings in the Chevelon Creek floodplain. The bushy stature of the pines is due to browsing by elk and cattle.

The cottonwoods, alders, and willows in the project area are all relatively mid-aged trees and shrubs. There are no old growth trees and shrubs and there are no seedlings in the area we visited. However, Gayle indicated there are some areas with more mature trees. Since it was November, we were not able to observe any defoliating insects or pathogens on these riparian species. Due to their young age, decay causing fungi were not noticeable. The impact that was evident on all hardwood species and ponderosa pine was browse damage by ungulates, both domestic and wild, particularly elk (Figures 1 & 2). On all species repeated browsing results in a bushy stature. Chronic browse damage to young trees and willows results in plants that stay under 4 feet in height. In the taller cottonwood and alder trees, the upper crown has more open branching but the bottom crown is dense and bushy from chronic browsing.

Ungulate herbivory can impact riparian vegetation in several ways, such as by reducing vigor or reproductive output of mature plants, and through increased mortality of seedlings and saplings. Differences between livestock and wild ungulates in their utilization of riparian vegetation intensify the impact. Livestock use is typically limited to the summer growing season, when they feed on leaves. Wild ungulates have access year round and are able to affect both leaves and stems. The latter has drastic impacts on species like willow, which rely on their stems and leaves for energy production and transport[1]. When energy reserves are used to replace stems and leaves there is little left for seed production. Willows do not reproduce by suckering like cottonwood and alder, they only reproduce by seed. Researchers have found that even relatively light levels of domestic livestock grazing, when coupled with intense wild ungulate browsing, strongly affect plant structure and limit reproduction of riparian willows[2]. Others have found impacts are high for other riparian trees and shrubs[3,4].

Figure 2 Narrow leaf cottonwood with bushy bottom branches due to ungulate browsing.

The proposed treatment will likely increase the health of mature cottonwoods and alders, which have a height advantage over both domestic and wild ungulates. Willow and regeneration of all tree and shrub species will be subjected to chronic browsing pressure and eventually be killed back. Although fencing is an option, it is expensive to install and maintain, and not a long term solution. Hopefully, ungulate populations will be reduced enough in the project area someday to allow recruitment of riparian species.

If you have any questions regarding this evaluation, please let us know. I can be reached at (928) 556-2075 (mfairweather@fs.fed.us, Mary Lou).

/s/ Mary Lou Fairweather
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